AMENDMENTS TO THE SPECIFICATION

Please replace the following below-indicated paragraphs with the below replacement paragraphs.

[0035] FIGS. 1 and 2 show a surgical power hand tool such as a surgical drill 100 having a tool body 102, a tool handle 104, a control switch 106, a chuck assembly 108, and a drill bit 110 having a tool tip 112 that rotates. Associated with the tool body 102 is a release button 114 and associated with the tool handle 104 is a battery pack 116. The tool body 102 has a distal end 118 Internal to tool body 102 is an electrical power consuming actuator, a motor 115, (shown as a cylinder in Figure 1) that actuates drill bit 112. Chuck assembly 108 thus releasably holds drill bit 110 to the drill and couples the bit to motor 115.

[0036] Also associated with the distal end 118 of the tool body 102 is a tracking and display unit 120. FIG. 1 shows the tracking and display unit 120 as attached to the surgical drill 100 while FIG. 2 shows an exploded view with the tracking and display unit 120 removed from the distal end 118 of the tool body 102. The tracking and display unit 120 has a display screen 122, a unit body 124, and a series of LED's 126 spaced on the surface of the unit body 124. The unit body 124 also has a wireless transceiver 128 that can transmit and receive data to and from a surgical navigation system 500 as shown in FIG. 16 using radio or infrared signals. Also located on the unit body 124 below the display screen 122 are a first function button 130 and a second function button 132, the operation of which will be discussed more fully hereinafter. Placed between the first and second function buttons 130 and 132 is a status light 134.

Typically the status light 134 will come on for a short period of time after pressing and holding one of the first or second function buttons 130 or 132 to switch on the tracking and display unit 120. Also the status light can be programmed to indicate the other changes in status such as by flashing a pre-designated number of times when a certain function is performed or requested.

[0037] As shown diagrammatically in FIGS. 1 to 3, the display screen 122 can simultaneously display multiple display elements. A tool tip position display 136 can be a single lit pixel or LED that indicates the position of the tool tip 112 relative to a predetermined target location. An orientation display 138 is also shown on the display screen 122 as a series of four spaced LED's or pixels in the shape of a cross. These four spaced LED's surround a center unlit LED such that the orientation display 138 can surround the tool tip position display 136. Other representations of the tool tip display 136 and the orientation display 138 are possible so long as the representation effectively communicates the desired information to the user.

[0039] The display screen 122 can be formed from any suitable display device capable of displaying a series of discreet pixels. The screen could be a liquid crystal display device (LCD) screen or it could be an array of LED's such as 12×12 array of LED's. The display screen 122 can be capable of displaying a single color or it can display multiple colors such that the different colors can indicate additional information to the surgeon. As is clear from the below description of the presentation on the display described with respect to Figures 6-9, in the described version of the invention, the presentation

is a symbolic location of the tool tip 112 less than an actual image of the tip at the target location. For certain procedures the display unit 120 may also have a hole or aperture through the display unit 120 to allow a guide wire or similar device to pass through the display unit 120. As shown in FIGS. 2 and 4, the tracking and display unit 120 is attached to the distal end 118 of the tool body 102 using a docking structure 152. The docking structure 152 is designed to accommodate and lock into place a docking pin 154, which is centered on the back 160 of the unit body 124. The docking pin 154 and the docking structure 152 are formed such that when the tracking and display unit 120 placed against the distal end 118 of the tool body 102 and urged forward, a center post 162 of the docking pin 154 will enter the center of the docking structure 152 and arms 164 attached to the center post 162 will fit within detents 166 so as to firmly orient and fix the tracking and display unit 120 in place on the distal end 118 of the surgical drill 100. Also, the docking pin 154 has an annular groove 168, which cooperates with a locking mechanism (not shown) within the docking structure 152. The release button 114 deactivates this locking mechanism and allows the tracking and display unit 120 to be removed from the surgical drill 100. Although not shown, it is possible to include on the back 160 and on the distal end 118 an electrical interconnect device such that the tracking and display unit 120 can be powered from the battery pack 116. However, it is preferable that tracking and display unit 120 have its own self-contained power source and, accordingly, a battery (not shown) can be inserted into the unit body 124 though a battery door 170. Owing to the presence of battery pack 116 for powering motor 115 and the fact that tracking and display unit 120 are battery powered, no cords extend from drill 100 and tracking and

display unit 120 of this invention. In addition to the docking pin 154 and the docking structure 152, any suitable method of attaching the tracking and display unit 120 to the tool body 102 can be used such as a bayonet coupling or other similar quick release positive locking coupling structure. In addition, the tracking and display unit 120 can be integral with the tool body 102.

[0041] FIG. 16 is a schematic view of the surgical navigation system 500. As disclosed in published application 2001/0034530, the disclosure of which is incorporated by reference, the surgical navigation system 500 includes a sensor system 502 and a computer system 504. The computer system 504 includes the monitor 506 and a computer (not shown) housed within a computer cart 508. The sensor system includes three CCD cameras 510 to wirelessly sense the location of the LED's 126. The sensor system 502 also includes a transceiver 512 to wirelessly communicate with the transceiver 128. The surgeon 514 will view the display screen 122 on the display unit 120 attached to the surgical drill 100 to guide the tool tip 112 to the pre-surgical planned predetermined position on the patient 516. This enables the surgeon 514 to maintain eye contact with the surgical site while at the same time having access to the same information that would be available on the monitor 506 providing better hand eye coordination for the surgeon 514 combined with the benefits of the information available from the surgical navigation system 500.

[0043] As can be easily appreciated, the fact that the tool tip 112 is in the correct x, y, z position does not mean that the drill bit 110 is properly aligned and oriented for the procedure

to begin. As shown in FIG. 6, the orientation display 138 shows that the alignment of the drill bit 110 is up and to the left. As the surgeon moves the drill 100 orientation down and to the right to the position diagrammatically shown in FIG. 7, the unaligned tool orientation display 138 will follow the movement down and to the right until such time as tool orientation display 138 surrounds the properly aligned tool tip position 136 to form a cross as shown as shown in FIG. 8. If the display screen 122 is monochromatic, all the display elements will be the same color and the combined tip position display 136 and orientation display 138 illustrated in FIG. 8 will indicate that the 25 drill bit 110 is in the proper, target orientation and that the tool tip 112 is in the correct position so that the procedure may begin. In addition, it is possible that the display could also flash individual display elements or groups of display elements or change the color intensity or brightness of these display elements to show the proper position and/or orientation has been achieved. As noted previously, the display elements that comprise the display screen 122 can be LED's or an LCD screen or similar display device comprising a series of pixels.

[0057] While the tracking unit and display 120 is particularly useful for power surgical tools that include cutting accessories such as drills, saws, and the like, and non-power hand tools or instruments such as biopsy needles, as disclosed herein, it can be used with a wide variety of other surgical tools and instruments, both powered and non-powered cutting accessories, such as, screw drivers, reamers, pointers, aspirators and the like where the surgeon will benefit from a display placed directly on the tool so that the surgeon can

maximize the benefits of the surgical navigation system 500 while using the tool without having to look away from the surgical site.